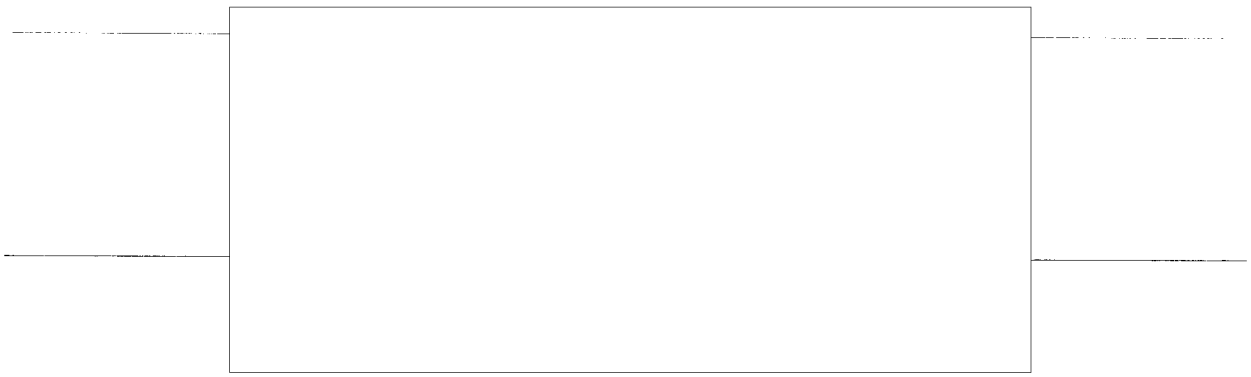
S&T Reporting Guide for the Developing Countries

25X1

December 1981

Copy 152

National Security Information Unauthorized Disclosure Subject to Criminal Sanctions



25X1

S&T Reporting Guide for the Developing Countries

25X1

December 1983

Preface

The purpose of this guide is to communicate to reporters the needs of national-level policymakers and decisionmakers for information on major foreign scientific and technical issues. It is intended to assist reporters in their selection from among the many topics with which they are confronted daily. This publication is not intended to establish priorities or to replace other guidance provided separately, but rather to assist in the development of relevant reporting on the topics cited.

This guide was prepared by an interagency working group sponsored by the Scientific and Technical Intelligence Committee. Questions concerning the content of this report should be directed to the Chairman of the Working Group, Mr. James Chamberlain, Department of State, telephone (202) 632-3872.

Members of the Working Group were:

[redacted] 25X1

[redacted] 25X1

Approved For Release 2008/07/22 : CIA-RDP05T00280R000200110011-3

Contents

S&T Reporting Guide for the Developing Countries

25X1

Introduction

This scientific and technical (S&T) reporting guide is the fourth and last of a series, although previous guides may be updated. The previous guides covered advanced industrial countries, the Soviet Union and Eastern Europe, and China. This reporting guide differs from the other three in that it covers a much more diverse group of countries. The principal focus of this guide must be on such "advanced" developing countries as India, Brazil, and the Republic of Korea. However, development in the LDC world is uneven, so that a relatively undeveloped country such as Pakistan has an advanced nuclear program, while Brazil, which has urban areas that rival the United States or Europe in development, faces rudimentary infrastructure problems in rural areas. This guide is, therefore, something of a smorgasbord of S&T subjects of interest to Washington. Not all subjects will be relevant for every country, but we hope it may encourage some useful S&T reporting from countries where S&T is generally thought to be unimportant.

This guide is not a shopping list, but rather a list of the kind of questions asked regularly during the course of policy formulation. Too often, these questions are answered without the benefit of current reporting from knowledgeable individuals in the field because the information needs were not conveyed to the field or were not clearly conveyed. The thrust of this guide is simply to improve the dialogue between policymakers and all government reporters on foreign S&T issues.

The information needs identified are not intended only for individuals with S&T expertise, but are addressed to all reporters in the field, particularly those in developing countries. In the same vein, the absence of an issue does not mean it is not important, but rather that its significance may not be clearly perceived from Washington. Initiative reporting and on-the-scene perspectives on evolving S&T issues are not only welcomed, but are solicited.

The principal consumers of the information identified in this reporting guide are the Office of Science and Technology Policy, the National Security Council (NSC), the Departments of State, Defense, Commerce, and Energy, and the several independent executive agencies and White House staffs routinely involved in the formulation, evaluation, and administration of US national security and foreign policy involving science and technology.

25X1

National S&T Policy

General

Background

Science and technology policy — the course of actions designed by a country to acquire and develop scientific knowledge and technological capabilities — is growing in importance to the less developed countries (LDCs) as a means of achieving national goals in economic development, health, welfare, security, and prestige. The proficiency of a nation in formulating, implementing and assessing its S&T policies directly affects its ability to make S&T contribute to economic development. The President's Science Adviser's Staff and the Department of State particularly use such information in the formulation of their policies and cooperation plans to improve relations with LDCs.

25X1

25X1

Key Information Needs

1. The principal factors in the formulation and implementation of S&T policy, including identification of influential groups and individuals, information on the degree of influence and control over S&T by the public and private sectors, and perspectives on the impact of national culture and attitudes toward science.

25X1

25X1

2. Groups and influences opposed to the host government's S&T policies, such as strong antinuclear movements. *Unique S&T roles played by any demographic*

25X1

group)—racial, religious, tribal—which might range from domination of S&T policy because of domination of the country as a whole, to exclusion because of lack of education.

3. The effectiveness of S&T policies in responding to the needs of the host country, including social, economic, political, and military.

4. The degree of influence that science policies have within a nation as observed by the amount and nature of interaction among scientists (domestic and foreign), policymakers, businessmen, and industry. (U)

5. The degree to which S&T are used as tools to achieve foreign policy objectives: the number of S&T agreements with other countries (which ones?); the amount of funds being spent under such agreements; the governmental or other elements initiating such agreements or other joint ventures; and special S&T relations with other countries.

6. The names of government and private S&T organizations that are responsible for S&T policy; their roles and subordination; and the capabilities and effectiveness of these organizations.

7. Science and technology plans of the host country and whether they are closely coordinated with the economic development plans. The degree to which they are, in fact, carried out.

8. The types of technology the country is interested in developing indigenously and the opportunities that exist in the country for development of new indigenous industries, such as availability of raw materials, native talents/capabilities, and markets. Obstacles to the development of these industries which could be overcome if aid specifically tailored to S&T were to be made available to the country.

9. The types of technology the country wishes to acquire from abroad. Nations it desires to do business with. As a general rule, does the country wish to acquire high-status, high-technology industries or does it want bread-and-butter industries more appropriate for its individual level of development? S&T fields in which the country wants educational and research aid.

10. Policies toward foreign institutions in S&T development, such as multinational corporations, UN agencies, and nongovernmental organizations. 25X1

25X1

11. *Whether the country intentionally or inadvertently serves as a channel to transfer technology to the Soviet Union or other Communist countries.* 25X1

25X1

Manpower, Education, and Facilities

Background

Shortages of S&T personnel are critical roadblocks to both economic development and effective S&T activities. Programs to alleviate these shortages and the effective use of trained personnel can improve the contribution of technology to a country's economic development. Information is needed on available S&T personnel in less developed countries to aid in the analysis of their capabilities and needs. Such analysis is used by the President's Science Adviser's Staff and the Department of State as well as other US Government agencies involved in cooperative S&T programs with LDCs. 25X1

25X1

Key Informational Needs

1. The thrust of science policy as indicated by the allocation of resources (funds, manpower, facilities, equipment) and by the views of prominent national personalities. Trends in university-level enrollments and degrees granted in various S&T disciplines. Government and industry educational programs (other than universities) in advanced S&T fields. Explanation of shifts in policy from objective to objective over time. 25X1

25X1

25X1

2. The quality and effectiveness of S&T education, of laboratories and other facilities, and the percentage of scientists and engineers educated *abroad.* Descriptions of outstanding research facilities are needed. 25X1

25X1

3. We also need reporting on the available number of S&T personnel, managers with experience in high-technology industries, and skilled technicians. 25X1

4. The extent to which the S&T educational system relies on foreign teachers, particularly from Soviet or other Communist countries. 25X1

25X1

Agriculture, Health, and Population

Background

The modernization of an LDC is prerequisite for feeding and providing adequate care for its people. This means balancing food supply, maintaining adequate health standards, and stabilizing the growth of the population. Since the amount of agricultural land available for cultivation in most of the LDCs cannot be appreciably increased, agricultural productivity can only be increased through application of modern S&T. Thus, to maintain the proper food/population balance and to improve the health of their people, the LDCs are increasingly looking to modern S&T to solve their problems. Information on the success or failure of these countries' efforts in these vital areas is needed by policymakers in the Departments of State and Defense and in the National Security Council.

Key Informational Needs

1. Progress in plant breeding to develop high-yield, pest- and disease-resistant food crop varieties.

2. Development or acquisition of manufacturing technologies for herbicides, pesticides, and fertilizers.

3. State of technology for food processing, storage, and distribution (that is, capability to get food from farms to the populace).

4. Progress in developing or acquiring technology for convenient, long-acting antifertility drugs. (U)

5. Progress on general health care of population to include population control, endemic diseases, and medical response.

Military S&T Issues

General

Background

The military status of individual LDCs and their relationship to larger military powers are important to the US Government, since these countries have increasingly become the center of regional arms conflicts that have the potential of escalating to worldwide confrontations. The future political stability and the international position of these countries depends to a large extent upon the development of a modern military capability. This information is of particular importance to the Department of Defense to provide an up-to-date evaluation of military capabilities throughout the world and to plan countermeasures. The Department of State needs to anticipate shifts in the military balance, arms control problems or possibilities, arms transfers, and new political relationships that may result. In addition, some LDCs are now becoming arms exporters of fairly sophisticated equipment. 25X1

Key Informational Needs

1. Success *or* failure in absorbing and applying advanced technologies, both foreign and domestic, in the development of new weapons systems, such as chemical and biological warfare, nuclear, advanced strategic missiles. *Conduits for the importation of such technology, such as training abroad, foreign teachers, or imported equipment.* 25X1 25X1

2. Information which would indicate the actual priority assigned to development and acquisition of military technologies within the context of overall modernization goals. 25X1 25X1

3. The emphasis on military technology applications as indicated by the allocation of resources (facilities, manpower, funds, equipment). 25X1 25X1

4. Identification of specific objectives and priorities in military modernization planning for the Army, Navy, and Air Force. Information on, and the rationale for, changes in policies and objectives both within and between the various services is of particular interest. 25X1 25X1

5. Identification of primary government and/or government-sponsored laboratories responsible for military technology development and key personnel in these organizations. 25X1

6. The degree to which LDCs are willing to become dependent on foreign military technology and/or assistance. 25X1

7. Development and/or acquisition of nuclear energy technology, nuclear weapons, and the nuclear fuel cycle.

8. Information of available technology that might be of use to terrorists, such as the hand-held surface-to-air missile.

9. Military technology or technically sophisticated equipment that is being exported

Nuclear Proliferation

Background

US policy guidelines on this issue address the problem of preventing additional countries from developing a nuclear explosives capability while maintaining the US's credibility as a supplier of nuclear equipment or material. There is a keen interest—in a number of Departments, including State, Energy, Defense, and Commerce, as well as CIA and other intelligence organizations—in knowing the status of the nuclear program of any LDC that has one. In most cases, the more detailed the information, the better, including such details as the manufacturer of equipment, or the shipper who delivered it. Policymakers are also interested in a broader view of the program—what the country's goal is: whether to supply a certain percentage of electrical energy with nuclear power, to develop a full nuclear fuel cycle, or to manufacture a nuclear explosive device.

Key Informational Needs

1. The importance of nuclear power to the country's energy plan.

2. status of any power reactors now operating or under construction

3. status of any research reactors now operating or under construction

4. Information on other parts of the nuclear fuel cycle, particularly enrichment and reprocessing. Which components of the fuel cycle already exist in country, and which are planned? What are their capacities and current status?

5. Who are the nuclear suppliers for the host country's program—both the nationality of the supplier and the names of the companies and individuals involved. 25X1

6. Nuclear cooperation agreements 25X1
With which countries does the host government 25X1
have such agreements? What do they cover? How do 25X1
any agreements with the United States fit into this framework? Government (and S&T community) attitudes toward cooperation with the United States. 25X1

7. The extent of indigenous nuclear research and expertise. What research facilities exist? How good are they? How large and well trained is the nuclear S&T community? Where were the scientists and technicians trained, and where are new personnel currently being trained? 25X1

8. Military aspects of the nuclear program. Does the government plan to build a nuclear weapon or explosive device? To what extent is the military involved in the nuclear program? Is the lead nuclear agency staffed by military officers or civilians? To whom does it report? Who funds the program? 25X1

9. Potential delivery systems for a nuclear weapon. What means of transportation currently in the host country's armed forces inventory could be used to deliver a nuclear weapon? What systems under development—particularly any rocket or missile—could be 25X1
used for delivery? 25X1

10. Any sales the host country may make to other LDCs of nuclear equipment. What is it selling and to 25X1
whom? 25X1
25X1
Space 25X1

Background

There is strong interest in the activities in space of 25X1
LDCs such as India and Brazil, who are known to be 25X1
trying to develop this capability, which could have military applications. The state of development in these countries will play an important part in the decisionmaking process in Washington. The United

25X1

States may have to make decisions on what space technology it can export. Use of space for military purposes, international communications, transportation, and scientific cooperation will all be areas of constant concern to the US Government in the future.

Key Informational Needs

1. A description of the civil space program, as well as any military or intelligence space programs of the pertinent countries.

2. State of development in remote sensing, satellite navigation, communication, and so forth. Specific views on the assignment of radio frequencies and satellite positioning.

3. Space-related research activities in which US or local scientists might cooperate, or should not cooperate.

4. LDC views on US missile technology transfer restrictions and their plans to "shop elsewhere."

5. Attitudes at the UN toward space issues such as remote sensing, direct broadcast satellites, and militarization of space.

Economic S&T Issues

Technology Transfer

Background

Upgrading a country's technology will probably have a significant effect on its economy and on its military capability. In addition, technology transfers may indicate a growing economic and political relationship between the countries involved. When the supplier is in the Eastern Bloc, the connection is of even greater interest. How technology is assimilated by the country's industry may shed light on which sectors of the economy will develop most rapidly, and on which industries may become more competitive with US industry.

Several LDCs, such as Brazil and Mexico, have national laws regulating technology transfer, industrial property, and foreign investment. Their purpose is to control the activities of multinational corporations and to ensure that technology is transferred to their countries on favorable terms. Information on the impact of these laws on *both* US companies and on the nations themselves is needed. 25X1

25X1

Key Informational Needs

1. The degree of satisfaction of the host country with its technology transfer procedures. The types of technology transfer interactions favored, such as government-to-government, government-to-industry, or industry-to-industry interactions. 25X1

25X1

2. The importance of official government-to-government cooperation in acquisition of technology vis-a-vis other transfer mechanisms. The host government's attitude toward such arrangements. A comparison of official cooperation with the United States against that carried on with other countries. 25X1

25X1

25X1

3. The role played by multinational corporations in technology transfer. The host government's attitudes toward technology transfer through multinational corporations. 25X1

25X1

4. The competence and functioning of the government organizations which review licensing agreements; the delays introduced by such review; the percentage of technology transfer contracts turned down and approved. 25X1

25X1

5. The effectiveness of the national laws as measured by whether they allow the government technology strategy to be followed without driving away the technology suppliers. 25X1

6. The degree to which technology-control mechanisms are enforced, ignored or circumvented by government-owned enterprises, government ministries, private enterprises, or corrupt officials. 25X1

7. The extent to which the host government permits, or even encourages, technology transfer in violation of international controls such as patents and copyrights or controls such as the embargo on exports to the Eastern Bloc enforced by CoCoM. 25X1

25X1

8. Any unique cultural traits, natural resources, or other characteristics which tend to facilitate or inhibit technology transfer.

9. New technologies or indigenous research and development that will assist in producing new goods or services that will allow the country to enter markets in which it has not participated before, particularly when it may compete with the United States.

10. Special relationships between the host government and industrialized countries. The effect such relationships may have on future acquisitions of technology, such as by limiting the number of accessories compatible with an imported system or by laying a solid technical base for future development in the country.

11. Host government attitudes toward retransfer of technology to third countries, especially to Communist countries or radical Third World countries.

12. Host government attitudes toward cooperation with other LDCs in obtaining, *selling,* or exploiting technology.

Impact of S&T on Economic Development

Background

Acquisition of technology is often viewed as a way to improve a country's economic situation. The Department of State, AID, and the intelligence agencies are interested in the extent to which this strategy has succeeded. Information on which strategies work, which have failed and why, and what unforeseen consequences have resulted from them will be of use to policymakers in deciding what approaches the United States should follow in dealing with developing countries. Reporting on the economic impact of technology assimilation is also useful to those in the US Government who follow a given country's internal affairs, since it can give insight into how the country will develop in the future.

Key Informational Needs

1. Government policies encouraging technology transfer as a means of speeding up development.

2. Imported or domestic technologies which have had the greatest impact 25X1 25X1

3. Unforeseen or unplanned side effects of the acquisition of technology; for example, pollution of water supplies as a result of industrialization, increased crop yields—caused by new plant varieties—that overload the transportation system, or unemployment as a result of mechanization of labor intensive industries. 25X1 25X1

4. Effects of assimilation of technology on the social structure; for example, an increase in the middle class due to increased numbers of skilled workers, or increasing alienation of the poor and uneducated. 25X1

Energy R&D and National Policies 25X1

Background

OPEC policies have put many nonoil LDCs in an energy bind. How they are able to cope with this energy crisis will have a significant effect on their internal development and their international role. Therefore the extent to which technology, as opposed to conservation or increased petroleum supply, can help supply the needed energy is of interest to a number of agencies, including Energy, State, and CIA. 25X1 25X1 25X1 25X1

Key Informational Needs

1. The breakdown of energy sources used by the country: amount of energy derived from petroleum, coal, and other major sources. 25X1

2. The extent to which the host country obtains energy from sources other than hydrocarbon fuels and traditional sources such as firewood. 25X1

3. The types of nonconventional energy sources currently in use, such as solar and geothermal sources. 25X1

4. Unique resources available to the host country for nonconventional energy production, such as nearby ocean suitable for ocean thermal energy conversion (OTEC), or crops suitable for alcohol production. 25X1 25X1

5. Domestic research and development on energy sources. What are funding levels? Quality and quantity of technical research personnel? [ ]

6. Government policies and programs designed to encourage the use of new energy technologies [ ]

7. Cooperative agreements with other countries or multilateral organizations on new energy technologies. Where does (could) cooperation with the United States fit into this framework? [ ]

8. Is there a special relationship between the host country and one of the industrialized countries for development of nonconventional sources of energy? [ ]

Impact on U.S. S&T

Background

Countries with little technological development may directly affect state-of-the-art technology in industrialized states, if, for example, the technology depends on use of rare minerals. The United States is dependent on foreign sources for many rare earths and metals. This Reporting Guide does not address strategic minerals per se, but rather minerals which may become of strategic importance in a few years as a result of emerging technologies. In this catagogy are niobium, hafnium, and gallium. A less direct impact could be denial of scientific data to the United States in one way or another. This might be through simple denial of access to the country by American scientists, or by interfering with information flowing through or over the country [ ]

Key Informational Needs

1. Host government policies restricting export of rare earths or metals. Agreements with other industrialized countries which monopolize output or otherwise prevent US access. [ ]

2. Any opposition within the country to establishment of US scientific installations there. [ ]

3. Policies restricting collection of scientific data within the country, either on land or in the ocean or on the seabed. [ ]

4. Attitudes toward the flow of information through or near the country, that is, claims to the geostationary orbit, position on direct broadcast satellites, interference with US transmissions, or interference with US reception signals [ ] 25X1

25X1

5. Successful assimilation of technology in industries in direct competition with US industry. Such competition may be for sales in other LDCs. Brazil, for example, has been successful in selling engineering and construction services, airplanes, and other products in markets which the United States has traditionally dominated [ ] 25X1

25X1

Global S&T Policy Issues

25X1

General

Background

The growing importance of S&T in multilateral and bilateral diplomacy results from a number of factors, ranging from general diplomatic considerations and broad questions of equity in international economic relations to nation-specific factors and shifts in expert opinion on the determinants of economic development. This growing recognition of the importance of S&T has been reflected in an accelerated pace of multilateral conferences and negotiations of S&T issues; for example, the UNCSTD (the United Nations Conference on Science and Technology for Development) conference in Vienna and WARC (World Administrative Radio Conference). The needs of the policymaker include information for developing proposals that would appeal to key LDCs. The United States must find a way to respond to the continuing rise in development expectations without being drawn into another round of recriminations or unfulfilled promises. At the same time information concerning the views and concerns of other major industrial nations is crucial in perfecting our own policy and plans. [ ] 25X1

25X1

Unilateral and/or multilateral policies and efforts between the industrial nations and LDCs are of interest. Regarding technology transfer, the principal 25X1

25X1

concern centers on the need to respond to LDCs' demands for technology transfer. There is also strong concern for problems that foreign technology transfer policies and government-sponsored actions might cause for the United States.

Key Informational Needs

1. Attitudes of host country toward the G-77 (the Group of 77, an informal caucus group of LDCs which now numbers more than 77), including degree of effectiveness in the North-South dialogue.

2. Role played by host country in G-77, including degree of activity; attitude toward compromise or confrontation.

3. Role played by host country at multilateral conferences, such as whether the role chosen is dominated by the stance of the G-77 or by national needs; the degree of government control over delegates (do they receive specific instructions?); impact of regional loyalties; and impact of the subject of the conference.

4. Host country views on bilateral S&T cooperation as an effective means of technology transfer.

5. Host country attitudes regarding the effectiveness of the UN multilateral organizations

6. Changes in attitudes toward UNCTAD (United Nations Conference on Trade and Development) Codes of Conduct on transnational corporations and technology transfer

7. Positions of host country on upcoming conferences with an S&T component

8. Retransfer of, or access to, advanced technologies with military applications by the USSR or Eastern Europe in the LDCs.

9. Positions of host government on international communications issues—radio frequency allocation in the ITU (International Telegraphic Union) and WARC, direct broadcast satellites, the "New World Information Order," and transborder data flow in general.

Oceans, Fisheries, and Polar Policies

Background

The US oceans policy is defined by numerous domestic policies on marine science, pollution, navigation, fisheries, and offshore development, as well as by international agreements and domestic legislation such as the Deep Seabed Mining Act, the Marine Mammal Act, and the Fisheries Conservation and Management Act. The Law of the Sea Conference has forced all nations to focus on the oceans as a resource (both living and nonliving), as a means of both commercial and military transit, and as an extension of their territory requiring management and regulation. Oceans technology has commercial and defense applications that have to be factored into assessments of a nation's strength.

25X1
25X1
25X1
25X1

Key Informational Needs

1. A description of the country's oceans and fisheries programs (academic, commercial, government, and private sector) concerning the oceans, fisheries, marine science, and marine technology. Mention specific projects under way or planned.

2. Plans to exploit offshore resources, such as fisheries or offshore oil and gas, or develop new marine resources and technologies, such as ocean thermal energy conversion (OTEC) or the deep seabed mining of manganese nodules

3. Positions on Law of the Sea and legislation relating to the oceans, coastal zones, or development—including positions on Arctic and Antarctic boundary, maritime security, seabed mineral exploitation, marine technology transfer, fisheries, marine pollution, and foreign marine science operations in its coastal zone.

4. Ocean activities of the host country in which the United States might cooperate. Attitudes toward cooperation with the United States on ocean research. Extent of cooperation with third countries.

25X1
25X1
25X1
25X1
25X1
25X1
25X1
25X1
25X1
25X1
25X1

5. Opportunities for maritime technology transfer, either as recipient or donor.

6. The effect of various US oceans legislation on host country's perception of its national position and programs

7. Maritime boundary problems with neighboring countries arising from extensions of coastal jurisdictions

8. Plans for research or exploration for or exploitation of resources in polar regions.

Environment and Natural Resources

Background

There is a strong interest in identifying key international environmental and natural resource problems and issues which may have an effect on the United States and other nations. In addition, US agencies are interested in identifying the alternative technical and international approaches which other nations are employing to deal with the problems

Key Informational Needs

1. General subject areas of interest include environment, health, population, food, and natural resources.

2. Specific problems of particular interest include environmental aspects of:

- Toxic substances, including regulations for use and transport, legislation, and programs.
- Energy and environment including legislation, institutional arrangements, nuclear waste disposal, and expanded use of coal.
- Global atmospheric carbon dioxide and Arctic haze.
- Tropical deforestation.
- Antarctic minerals and fisheries, resources, and regimes.
- Weather modification efforts of host countries.

3. Some specific areas of interest relating to natural resources are:

- Rare minerals which may become important with the development of new technologies such as niobium, hafnium, gallium.
- Government and popular attitudes toward exploitation of natural resources, renewable or not.
- Plans for replacing exploited living resources.
- Competition from other foreign countries for the host country's natural resources.

25X1

25X1

25X1

25X1

25X1

25X1

25X1